REMARKS

Claims 1, 2, 4 and 6-10 are pending in this application. By this Amendment, the specification and claims 1, 2 and 8 are amended. Claims 1 and 2 are amended to recite features supported in the specification at, for example, page 13, line 23 – page 16, line 4 and Figs. 4-6. No new matter is added by any of these amendments.

Reconsideration based on the following remarks is respectfully requested.

I. The Specification Satisfies All Formal Requirements

The Office Action objects to the specification based on informalities. The specification has been amended to obviate the objection. Withdrawal of the objection to the specification is respectfully requested.

II. The Claims Satisfy All Formal Requirements

The Office Action objects to claim 8 based on informalities. Claim 8 has been amended to obviate the objection. Withdrawal of the claim objection is respectfully requested.

III. The Claims Satisfy the Requirements under 35 U.S.C. §112, first paragraph

The Office Action rejects claims 1, 2, 4 and 6-10 under 35 U.S.C. §112, first paragraph, based on lack of enablement. This rejection is respectfully traversed.

Subject matter to which claims 1, 2, 4 and 6-10 pertain is supported in the specification at page 13, line 23 – page 16, line 4 and Figs. 4-6. Withdrawal of the rejection under 35 U.S.C. §112, first paragraph is respectfully requested.

IV. The Claims Satisfy the Requirements under 35 U.S.C. §112, second paragraph

The Office Action rejects claims 1, 2, 4 and 6-10 under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 1 and 2 have been amended to obviate this rejection in view of the Examiner's helpful comments. Withdrawal of the rejection under 35 U.S.C. §112, second paragraph is respectfully requested.

V. Claims 1, 2, 4 and 6-10 Define Patentable Subject Matter

The Office Action rejects claims 1, 2, 7, 9 and 10 under 35 U.S.C. §102(b) over U.S. Patent 5,857,140 to Foster. The Office Action further rejects claims 4, 6 and 8 under 35 U.S.C. §103(a) over Foster. These rejections are respectfully traversed.

The Office Action further rejects claim 1 under 35 U.S.C. §102(b) over Japanese Patent Application JP Heisei 07-232082 to Houdaira *et al.* ("Houdaira"); rejects claim 1 under 35 U.S.C. §102(b) over Japanese Patent Application JP Heisei 01-119820 to Nakagawa *et al.* ("Nakagawa"); and rejects claim 1 under 35 U.S.C. §102(b) over Japanese Patent Application JP Showa 61-066610 to Kajima. Further, the Office Action rejects claims 2, 4 and 6-10 under 35 U.S.C. §103(a) over Houdaira, Nakagawa or Kajima in view of Foster. These rejections are respectfully traversed.

None of Foster, Houdaira, Nakagawa and Kajima, alone or in combination, teach or suggest an exhaust emission control system of an internal combustion engine, comprising (A) an internal combustion engine; and (B) an exhaust gas purifying catalyst provided in an exhaust passageway of the internal combustion engine, the exhaust gas purifying catalyst including (a) a box body formed with an exhaust gas inlet and an exhaust gas outlet; (b) a catalyst support incorporated into the box body; (c) a catalyst substance supported on the catalyst support, the catalyst substance forming a region through which exhaust gas passes from a front face at the exhaust gas inlet to a rear face at the exhaust gas outlet; and (d) a low resistance region within the catalyst substance extending from part of the front face through the catalyst substance to part of the rear face, wherein the low resistance region provides a lower gas flow resistance than in the catalyst substance, and the low resistance region is disposed within the catalyst substance to produce a higher flow velocity of the exhaust gas than through the catalyst substance, the low resistance region includes a notched portion that is recessed from the front face of the catalyst substance, and the notched portion extends from

the front face to a position between the front and rear faces, as recited in claim 1, and similarly recited in claim 2.

For example, the specification discloses various exemplary aspects of a gasoline engine having an engine body with an exhaust valve leading to an exhaust port connected to an exhaust manifold. A three-way catalyst converter is disposed downstream of the exhaust manifold and a casing. The three-way catalyst converter includes shock absorbing material holding a honeycomb cell with catalyst material. A notched portion is disposed within the cell extending from the exhaust manifold on the upstream side to a low resistance area leading to the exhaust pipe on the downstream side (page 14, line 19 – page 15, line 8 and Figs. 4-6).

Instead, Foster discloses a catalytic converter 10 having an oval cross-section shaped by a housing 12 and terminating at edges 14. In particular, Foster teaches a cavity in the housing 12 to enclose a ceramic substrate 18 that is coated with a high surface area material. The coating is catalyzed with a precious metal to purify the exhaust gases entering from the inlet face 20 and exiting the outlet face 22. The substrate 18 includes depressions at these faces. The substrate 18 is supported by a mat 24 in the form of a thermally expandable sleeve (col. 4, lines 24-64 and Figs. 1-3 of Foster).

Applicant respectfully asserts that the notched portion provided in the part of the exhaust gas inflow sided end surface of the catalyst support, or alternatively the part of the exhaust gas outflow sided end surface of the exhaust catalyst support facilitates the exhaust gas to be directed with reduced pressure losses into the low resistance area, thereby producing a higher flow velocity of the exhaust gas than through the catalyst substance.

Thus, the notched portion is provided in the part of the exhaust gas inflow sided end surface or else the part of the exhaust gas outflow sided end surface of the exhaust catalyst support. The augmented flow through the low resistance area, as a result of the notched

portion, produces a heat spot formed in the catalyst support. The heat spot enables the temperature of the catalyst support to increase, thus improving performance of the catalyst. For exemplary embodiments, these features are described in the present disclosure at page 14, line 7 through page 16, line 2.

Foster further teaches that a catalyst substrate 46 includes a recessed inlet 48 (col. 6, lines 14-28 and Fig. 6 of Foster) to prevent the exhaust gas from flowing directly into the mat 24 so as to improve its durability. In contrast, Applicant's claimed features are directed to a low resistance region through which exhaust gas passes extending through the catalyst substance. Thus, a heat spot is formed from the flow through the low resistance area, that Foster lacks.

Further, Houdaira discloses a catalyst converter 1 having first and second carriers 10, 20. In particular, Houdaira teaches an end face 21 showing a cylindrical recess region 12 (Abstract and drawing 1 of Houdaira).

Houdaira teaches the recess region 12 on an upstream side of an end surface of a second carrier 20, which is rapidly exposed to the exhaust gas from the first carrier 10, so as to improve the activation of the catalyst. However, Houdaira lacks any corresponding configuration to a low resistance region to produce a higher flow velocity, as provided in Applicant's claimed features. Instead, in order to communicate between inlet 30 to outlet 31, Houdaira requires the gas to flow through the first carrier 10. Additionally, Houdaira teaches a high density material 16 along the outer rim of the recess region 12, thereby teaching away from Applicant's claims.

Also, Nakagawa discloses a catalytic converter 1. In particular, Nakagawa teaches a layered structure 1 containing catalyst with a parallelpiped cross-section along one end to facilitate a lower pressure drop through the center portion of the catalytic converter (Abstract and drawing 1 of Nakagawa). However, Applicant respectfully asserts that Nakagawa lacks

any teaching or suggestion of a low resistance region within the catalyst substance extending through the catalyst, as recited in the claimed features.

In addition, Kajima discloses a catalytic converter 1. In particular, Kajima teaches a case 2 that contains catalyst in a layered structure 3 and a cone 5 facing a gas inlet 4 (Abstract and drawing 1 of Kajima). Nonetheless, Applicant respectfully asserts that Kajima lacks any teaching or suggestion of a low resistance region within the catalyst substance extending through the catalyst, as recited in the claimed features.

A claim must be literally disclosed for a proper rejection under §102. This requirement is satisfied "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" (MPEP §2131). Applicant asserts that the Office Action fails to satisfy this requirement with Foster, Houdaira, Nakagawa and Kajima.

Further, there is no motivation to combine features related to the first and second carriers of Houdaira, the low-pressure-drop design of Nakagawa or the conical recess of Kajima with the thermally expandable sleeve of Foster, nor has the Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicant's claimed features.

A *prima facie* case of obviousness for a §103 rejection requires satisfaction of three basic criteria: there must be some suggestion or motivation either in the references or knowledge generally available to modify the references or combine reference teachings, a reasonable expectation of success, and the references must teach or suggest all the claim limitations (MPEP §706.02(j)). Applicant asserts that the Office Action fails to satisfy these requirements with Foster, Houdaira, Nakagawa and Kajima.

For at least these reasons, Applicant respectfully asserts that the independent claims are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed, as well as for the additional features they recite. Consequently, all the claims are in condition for allowance. Thus, Applicant respectfully requests that the rejections under 35 U.S.C. §§102 and 103 be withdrawn.

VI. Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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